## DETAILED ACTION

## EXAMINER'S AMENDMENT

1.      An examiner's amendment to the record appears below. Should the

changes and/or additions be unacceptable to applicant, an amendment may be filed as

provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be

submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview

with Attorney Robert Chee on 10/29/2009.

**In the specification:** Please replace paragraph [0031] with amended paragraph [0031]

as following:

[0031] Common forms of computer-readable storage medium include, for example, a

floppy disk, a flexible disk, hard disk, magnetic tape, or any other magnetic storage

medium, a CD-ROM, any other optical storage medium, a RAM, a PROM, and EPROM,

a FLASH-EPROM, any other memory chip or cartridge, as described hereinafter.

Common forms of transmission media includes, for example a carrier wave.

### In claims:

Please replace claims with all prior versions, and listings, of claims in the

application:

1.      (Previously Presented)  A method of operation within a data processing system,
        the method comprising:
        before receiving a request to execute a statement that requires computation of a
                first function, associating the first function with a second function that
                returns a data type descriptor for the first function;
        receiving a request to execute the statement that requires computation of the first
                function to return data from a source; and
        in response to receiving the request to execute the statement, performing the
                steps of:
                executing the second function to obtain the data type descriptor that
                        identifies one or more data types of result data that should be
                        returned for the first function;
                registering the one or more data types with a data processing system;
                compiling the statement based on the registered one or more data types;
                executing the first function to obtain the result data;
                storing the result data obtained from the source in a format that reflects
                        the registered one or more data types; and
                returning the result data as data in the format of the registered one or
                        more data types,
        wherein the method is performed by one or more computing devices.


2-3.    (Canceled)


4.      (Previously Presented)  The method of claim 1 further comprising determining
        that the source is associated with the request by determining whether a certain
        keyword is specified as a data return type for the first function.


5.      (Previously Presented)  The method of claim 1 further comprising determining
        that the source is associated with the request by determining whether the first
        function returns data in an array of data elements.

6-8.    (Canceled)

9.      (Previously Presented)  The method of claim 1 wherein the data type descriptor

        indicates an arrangement of rows and columns of a database table and wherein

        storing the result data obtained from the source in a format that reflects the

        registered one or more data types comprises tabulating the result data according

        to the arrangement of rows and columns.

10-15.       (Canceled)

16.     (Currently Amended)  A system comprising:

        a processor;

        a processing entity; and

        a memory coupled to the processing entity and having program code stored

                therein which, when executed by the processing entity, causes the

                processing entity to:

        before receiving a request to execute a statement that requires computation of a

                first function, associate the first function with a second function that

                returns a data type descriptor for the first function;

        receive a request to execute the statement that requires computation of the first

                function included in the program code to return data from a source; and

        in response to receiving the request to execute the statement, performing the

                steps of:

                        executing the second function to obtain the data type descriptor that

                                identifies one or more data types of result data that should be

                                returned for the first function;

                        registering the one or more data types with a data processing system;

                        compiling the statement based on the registered one or more data types;

                        executing the first function to [[the]] obtain the result data,

storing the result data obtained from the source in a format that reflects
the registered one or more data types; and

returning the result data as data in the format of the registered one or
more data types.


17-21.        (Canceled)


22.    (Previously Presented)  A volatile or non-volatile computer-readable storage
medium carrying one or more sequences of instructions which, when executed
by one or more processors, causes the one or more processors to:

before receiving a request to execute a statement that requires computation of a
first function, associate the first function with a second function that
returns a data type descriptor for the first function;

receive a request to execute the statement that requires computation of the first
function to return data from a source; and

in response to receiving the request to execute the statement, performing the
steps of:

executing the second function to obtain the data type descriptor that
identifies one or more data types of result data that should be
returned for the first function;

registering the one or more data types with a data processing system;

compiling the statement based on the registered one or more data types;

executing the first function to obtain the result data,

storing the result data obtained from the source in a format that reflects
the registered one or more data types; and

returning the result data as data in the format of the registered one or
more data types.


23-24.        (Canceled)

25.     (Previously Presented) The method of claim 1 wherein the registered one or
        more data types is used to type-check the first function.


26.     (Previously Presented)  The volatile or non-volatile computer readable storage
        medium of claim 22 further comprising determining that the source is associated
        with the request by determining whether a certain keyword is specified as a data
        return type for the first function.


27.     (Previously Presented)  The volatile or non-volatile computer readable storage
        medium of claim 22 further comprising determining that the source is associated
        with the request by determining whether the first function returns data in an array
        of data elements.


28.     (Previously Presented)  The volatile or non-volatile computer readable storage
        medium of claim 22 wherein the data type descriptor indicates an arrangement of
        rows and columns of a database table and wherein storing the result data
        obtained from the source in a format that reflects the registered one or more data
        types comprises tabulating the result data according to the arrangement of rows
        and columns.


29.     (Canceled)


30.     (Previously Presented)  The volatile or non-volatile computer readable storage
        medium of claim 22 wherein the registered one or more data types is used to
        type-check the first function.


31-34.          (Canceled)

35.     (Previously Presented)  The system of claim 16 further comprising determining
        that the source is associated with the request by determining whether a certain
        keyword is specified as a data return type for the first function.

36.     (Previously Presented)  The system of claim 16 further comprising determining
        that the source is associated with the request by determining whether the first
        function returns data in an array of data elements.

37.     (Previously Presented)  The system of claim 16 wherein the data type descriptor
        indicates an arrangement of rows and columns of a database table and wherein
        storing the result data obtained from the source in a format that reflects the
        registered one or more data types comprises tabulating the result data according
        to the arrangement of rows and columns.

38.     (Previously Presented)  The system of claim 16 wherein the registered one or
        more data types is used to type-check the first function.

39.     (Previously Presented)  The method of Claim 1 wherein the one or more
        registered data types are temporary and are deleted (a) when execution of the
        statement is complete or (b) when a compilation of the statement is deleted,
        overwritten, or otherwise removed from memory.

40.     (Previously Presented) The method of Claim 1 wherein the one or more
        registered data types includes a flag to indicate that the one or more registered
        data types are temporary;
        executing a process periodically to identify temporary data types; and
        deleting the temporary data types identified for which (a) execution of all
                statements referencing the one or more data types is complete or (b)

where compilations of all statements referencing the one or more data types have been removed from memory.

41. (Previously Presented) The volatile or non-volatile computer readable storage medium of Claim 22 wherein the one or more registered data types are temporary and are deleted (a) when execution of the statement is complete or (b) when a compilation of the statement is deleted, overwritten, or otherwise removed from memory.

42. (Previously Presented) The volatile or non-volatile computer readable storage medium of Claim 22 wherein the one or more registered data types includes a flag to indicate that the one or more registered data types are temporary; executing a process periodically to identify temporary data types; and deleting the temporary data types identified for which (a) execution of all statements referencing the one or more data types is complete or (b) where compilations of all statements referencing the one or more data types have been removed from memory.

43. (Previously Presented) The system of Claim 16 wherein the one or more registered data types are temporary and are deleted (a) when execution of the statement is complete or (b) when a compilation of the statement is deleted, overwritten, or otherwise removed from memory.

44. (Previously Presented) The system of Claim 16 wherein the one or more registered data types includes a flag to indicate that the one or more registered data types are temporary; executing a process periodically to identify temporary data types; and deleting the temporary data types identified for which (a) execution of all statements referencing the one or more data types is complete or (b)

where compilations of all statements referencing the one or more data
types have been removed from memory.


## *Allowable Subject Matter*

2.     Claims 1, 4-5, 9, 16, 22, 25-28, 30, 35-44 are allowed.

The prior art of record alone or in combination, does not teach or fairly suggest
the combination of steps as recited in independent claims 1, 16 and 22,
wherein "executing the second function to obtain the data type descriptor
that identifies one or more data types of result data that should be
returned for the first function, associating the first function with a second
function that returns a data type descriptor for the first function;
registering the one or more data types with a data processing system;
compiling the statement based on the registered one or more data types;
executing the first function to obtain the result data;
storing the result data obtained from the source in a format that reflects
the registered one or more data types; and
returning the result data as data in the format of the registered one or
more data types".

## Contact Information

3.        Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cam Y T. Truong whose telephone number is (571) 272-4042.  The examiner can normally be reached on Monday to Firday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tony Mahmoudi can be reached on (571) 272-4078.  The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.  Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cam Y Truong/
Primary Examiner, Art Unit 2169